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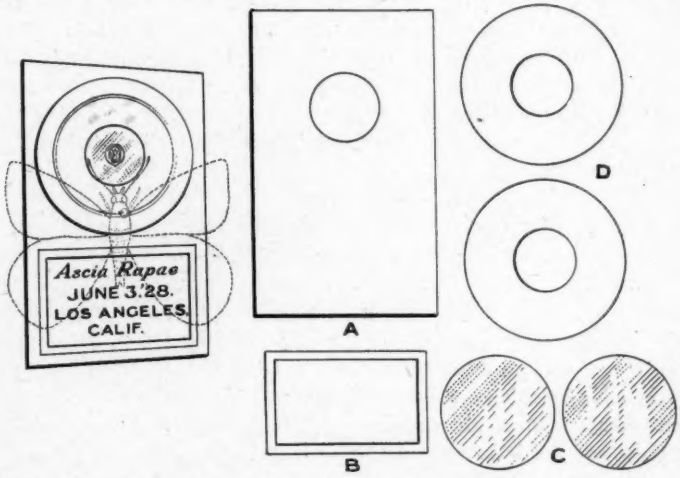
MOUNTED GENITALIA ATTACHED TO SPECIMENS.

BY J. D. GUNDER,
Pasadena, Calif.

As a rule the genitalic organs of insects are mounted on standard glass slides. These slides have to be kept separate from the specimens they represent in a slide-box by themselves and for this reason there is always a chance of misplacement or loss due to eventual separation. Another point is that the all-glass slides are more easily breakable and are apt to "age" as the years go by.

The mounting process illustrated and described in this article allows the genitalia to be placed with and permanently kept on the pin of the insect from which it was taken. This is quite an advantage where the specimens are "types," as all type parts should be assembled as a unit. This manner of mounting or rather a similar arrangement has been termed the "Balsam card cell process" and I am indebted to Mr. W. M. Giffard of Honolulu for much information about it.



He has used successfully a modified style for mounting the male genitalia of Delphacidae (Homoptera). (See *Annals Ent. Soc. of Am.*, Vol. XIV, p. 137, June, 1921). Mr. B. B. Keifer of the Academy in San Francisco has mounted a number of the valuable W. G. Wright butterfly types if this manner and the Academy people find this scheme very satisfactory. Other entomologists in Europe have used variations of the same idea from time to time.

The process is simple, reasonable and "easy to do." It requires only the parts (all illustrated) as follows:—

(A) A piece of smooth Bristol board cut about 1 by 1½ inches with a cell about 9mm. cut or punched about center at one end. The thickness of the Bristol board used depends upon the cell depth needed. If a flat pressed mount

is desired, then a thin board (calling-card thickness or less) should be used; if the genitalia is heavy and depth is needed, then a thicker quality Bristol board should be used. On the bottom side (either side) of the board over the hole place one of the-

(C) round microscopic cover-glasses (15mm. size in diameter). This can be held in place by one of the-

(D) Dennison's, No. 3, gummed cloth, round punched reinforcements. The bottom side or cell cup is then complete and ready (after drying a moment) for the balsam and placing in of the prepared genitalia. The cell space only requires a drop or so of Canada Balsam and the genitalic parts can be arranged therein and centered as usual. When this is done, place on top the remaining cover-glass and stick it down with the other gummed reinforcement. The slide is then complete and requires no further adjustment or chemical attention, neither dose it require "drying" over a long period as do ordinary glass slide mounts. It may be handled at once without harm. In the illustration, I show-

(B) a label for the mount. It is better to make a label for the Bristol board and stick it on than to write directly thereon it, because if a mistake is made, a new label is easier to make than a correction on the board. Regarding labels, if the mount is a type then label it thus. Also it is advisable to sign and date the mounting so that future students will know who did the work. This extra data can be noted on the reverse sides. The mount now being complete in every respect, it can be pinned under the insect as illustrated, together with what other labels the specimen has. The mount is not apt to sag on the pin if it is stuck through the outer edge of the cloth circle. There is very little weight to genitalia put up in this fashion. They can be sent by mail with less danger of breakage than the older style.

NOTES ON THE EARLY STAGES OF ANISOTA MANITOBENSIS. (LEPID.).

BY H. J. BRODIE,
Winnipeg, Man.

The moth *Anisota manitobensis* was described by Dr. J. McDunnough of Ottawa in "The Canadian Entomologist" (Vol. LIII, No. 4), from four specimens taken by Mr. N. Criddle at Aweme, Manitoba. The early stages of this moth have been unknown up to the present. I have recently had the opportunity of studying these and the following notes are offered as a result.

On June 27th, 1928, a female moth of this species was taken by Mr. T. Short in Winnipeg. The moth was found in the act of ovipositing and moth and eggs were sent to me with the following information: "The eggs were deposited on a branch of oak about 1½ feet from the ground. They were laid in the sunshine, facing west, at about four o'clock in the afternoon."

The eggs were laid on the branch in a cluster of forty and may be described as ovate and flattened, 1.51 mm. by 1.25 mm., bright sulphur yellow, shiny, quite opaque and perfectly smooth.

A week later the ova had become very much flattened and were brownish in color. The eggs hatched July 10th and leaves of the Bur Oak (Q. macrocarpa) were provided.

Stage I. The newly hatched larvae were 3 mm. long and 0.4 mm. wide; body creamy white, head shiny black; a wide dorsal and a narrow lateral brownish-black line running the length of the body; spiracles brownish; six simple jet black spines on each of segments 4 to 12, these spines arranged in longitudinal rows, two dorsal and four lateral; the two dorsal spines on the third segment larger, each with a stout basal part supporting two relatively long hairs pointing anteriorly; anal segment black with spines in different positions from those on segments 4 to 12. As the larvae grew the colours changed to light and dark tan and black. They moulted first on July 15th.

Stage II. Length 7 mm., breadth 1.4 mm.; body shiny black, head dark tan; two dorsal cream coloured stripes running the length of the body and 0.2 mm. wide; tips of pro-legs greyish; a short light cream coloured stripe running diagonally through each spiracle; spiracles black; ventral side of the larva dull cream to buff; the two large spines on the third segment relatively long (2.2 mm.) bifurcating at the tip; anal segment black; rows of spines on the larva as in Stage I, each spine with a short stout base and terminating in a fine hair. The larvae moulted for the second time on July 20th.

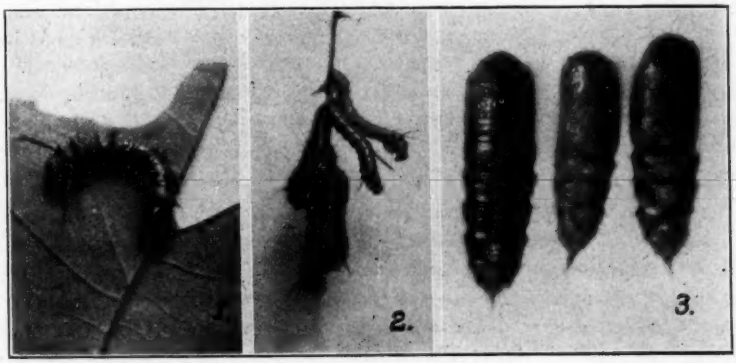


Fig. 1. A larva after third moult. Fig. 2. Position of young larvae when moulting. Fig. 3. Pupae.

Stage III. Length 10 mm., breadth 2.1 mm.; head light tan; dorsal cream coloured stripes still present, 0.3 mm. wide; the two large anterior spines 3.5 mm. long, with side branches and bifurcating at the tips; each other spine doubly branched, shiny black at the base, snow white toward the tip and ending in a stiff hair; anal segment black with spines almost entirely white; a short white streak running diagonally through each spiracle; ends of pro-legs brown. The colours of the larvae changed rapidly, until by July 22nd, those parts described above as black became dark brown. The dorsal cream coloured lines became a dark shade of buff. The larvae had a very shiny appearance at this stage. The third moult occurred on July 25th.

Stage IV. Length 22 mm., breadth 3 mm.; head light tan, body shiny dark brown with the two lighter brown dorsal stripes 1 mm. wide; spiracles black; large anterior spines 5 mm. long, shiny black with white branches; other spines similarly coloured; a frill of doubly branched spines just behind the head; a few

short white spines scattered about, especially on the anal segment; anal segment dark brown; true legs black, pro-legs dark brown. The white on the spines gave the larvae the appearance of being covered with hoar-frost. Again the colours changed, the larvae becoming light pinkish-brown. The fourth moult occurred on July 30th.

Stage V. Length 30 mm., breadth 5 mm.; little change from the previous instar; head paler tan; true legs pale tan; body light pinkish brown; many more spines were white than before; large anterior spines same length and colour as before; spiracles black with light pinkish margin.

When mature, the larvae were 50 mm. long and 8 mm. wide. They were of a pinkish-tan colour, but little changed from the above description. The area between the two dorsal stripes with a thin central black line and with dark shading on either side of this line. The anterior spines were 6 mm. long.

The pupating larvae did not spin any silk and made only slight attempt to burrow into earth provided. The first pupa appeared on Aug. 11th and was golden yellow when freshly emerged.

Pupa. When hard, the pupa was reddish brown; 29 mm. long, 7 mm. wide at the base of the thorax widening at the head to 8 mm.; pupa with many glistening spines and granules; head on the ventral side provided with two short spines, one at the base of each antenna; a number of still shorter spines scattered about this area; two smooth flat and rounded tubercles, 1 mm. apart, on the dorsal side of the thorax just back of the head; each segment of the abdomen provided with a complete ring of barbs inclined posteriorally; cremaster relatively long (3 mm.), flattened ventrally, shiny black, hard and bifurcating at the tip into two very sharp points; a number of short spines on the anal segment.

From the original forty larvae, only six pupae were obtained. In the early stages the larvae seemed very difficult to rear. They died one by one due to some accident or other. Matters were improved however, when by rare fortune I found a cluster of over one hundred larvae of the species on a young oak by the river bank on July 19th. The attitude of these larvae when I found them is worthy of note. It appeared later that they were just about to moult and they were arranged on the leaf from which they had been eating, in a most characteristic manner. All but the mid-rib of the leaf had been eaten. On this the larvae were huddled, the three posterior segments close to the stem and the rest of the body raised outward, much after the manner of the larvae of the Sphingidae. This pose was again assumed by the larvae when they underwent the second moult but not in any later moult. The attitude is fairly well shown in the accompanying figures..

Of this mass of larvae, not one died and all pupated like the others, the pupae being fairly constant in size.

I should like to express my thanks to Mr. T. Short, through whose kindness my attention was drawn to the life history of this insect.

THREE NEW SPECIES OF SPIDERS (FAMILY LINYPHIIDAE).

BY C. R. CROSBY AND SHERMAN C. BISHOP,
Cornell University.

Micronetа disceptra n. sp.

Figures 1-3

Male. Length, 2.1 mm. Cephalothorax dusky orange, very lightly marked with radiating lines; viewed from above, rather broad, evenly rounded on the sides, narrowed towards the front, broadly rounded in front; viewed from the side gently rounded to the posterior eyes. Clypeus straight and slightly protruding. A tooth on the face of the chelicera.

Posterior eyes in a slightly recurved line, the median a little smaller than the lateral, separated by a little less than the diameter and a little nearer to the lateral. Anterior eyes in a straight line, the median smaller than the later, equidistant, separated by less than the radius. Clypeus about as wide as the median ocular area. Sternum dusky orange-yellow, sparsely clothed with long black hairs, gently rounded on the sides, convergent behind, produced to a truncate point between the hind coxae which are separated by a little less than the diameter. Labium colored like sternum; endites pale yellowish, slightly grayish. Chelicera orange-yellow, rather thick at base, divergent, armed with a large tooth on face and fine denticulations laterally. Legs and palpi pale orange-yellow. Coxae beneath narrowly margined with dark gray. Abdomen grayish and crossed posteriorly by indistinct light lines; under side gray with the two usual light lines.

The femur of the palpus slender and slightly curved. Patella very short and moderately curved, armed above at tip with two or three stout black spines. Ratio of length of femur to that of patella as 16 to 5. The tibia strongly compressed; on the middle of the dorsal surface it bears a very large forward-curved process which when viewed from behind is narrow in the middle, large at the tip with the front bent at a right angle laterally. The surface of the tibia distad of this process is without hair, thin and strongly concave, the margin produced into a broad lobe with a gently undulate margin. The paracymbium (*par*) is rather slender, strongly curved and slightly hooked at the tip; from the middle of the convex side it bears a sharp, triangular tooth. The embolic division (*e. d.*) consists of a very large, heavy plate which is folded upon itself so as to leave a narrow cleft between the two parts. The part of the fold towards the lateral side of the palpus is developed into a very large, long triangular tooth, bluntly rounded at the tip, which projects ventrally at right angles to the tarsus. The embolus is a very small tubercle lying between the base of this large tooth and the edge of the cymbium. The median apophysis appears as a broadly triangular plate between the base of the tooth and the edge of the cymbium.

Holotype ♂. Peru: Huacapistana, Rio Farma, June 2, 1920 1 specimen.

Micronetа gargopa n. sp.

Figures 4-6

Male. Length, 1.2 mm. Cephalothorax dusky orange narrowly margined with black; viewed from above evenly rounded on the sides, slightly constricted at the cervical groove, evenly rounded in front; viewed from the side, steeply ascending behind, then more gradually to the highest point just back of the posterior eyes. Clypeus straight, slightly protruding.

CAN. ENT. VOL. LXI. PLATE 2.

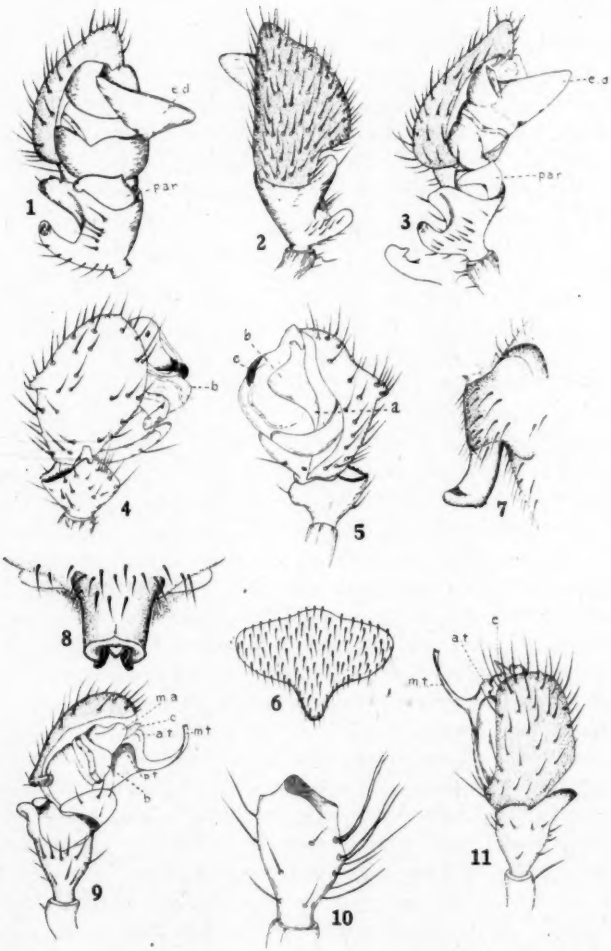


Fig. 1 *Microneta disceptra,* male palpus, ventro-lateral view. Fig. 2 *Microneta disceptra,* male palpus, dorsal view. Fig. 3 *Microneta disceptra,* male palpus, lateral view. Fig. 4 *Microneta gargopa,* male palpus, dorso-lateral view. Fig. 5 *Microneta gargopa,* male palpus, mesal view. Fig. 6 *Microneta gargopa,* epigynum. Fig 7 *Hilaira balia,* epigynum side view. Fg. 8 *Hilaira balia* epigynum, ventral view. Fig. 9 *Hilaira balia,* male palpus, lateral view. Fig. 10 *Hilaira balia,* male palpus, tibia. Fig. 11 *Hilaira balia,* male palpus, dorsal view.

Posterior eyes in a straight line, equal, equidistant, separated by a little less than the diameter. Anterior eyes in a straight line, the median smaller than the lateral, separated by a little more than the radius and from the lateral by a little less than the diameter. Clypeus a little narrower than the median ocular area.

Sternum grayish orange-yellow, broad, rounded on the side, produced in a broad truncate point between the hind coxae which are separated by the diameter. Labium same color as sternum, endites orange-yellow. No tooth on face of chelicera. Legs and palpi orange-yellow. Abdomen dark gray, almost black.

Femur of palpus rather stout, moderately long and curved, a little widened distally. Patella short, strongly arched above. Ratio of length of femur to that of patella as 13 to 5. Tibia longer than patella and strongly widened, the dorsal margin thin, broadly and gently emarginate in the middle, on the lateral side, the edge is finely serrate and is continuous with a high prominent ridge that crosses the tibia obliquely, some distance from the margin. When viewed from the base of the segment, the ridge is seen to have a black margin which is finely serrate. The back of the cymbium is distinctly angulate, in the side view nearly square; on the angle the setigerous tubercles are larger and more prominent. The paracymbium broad, evenly and strongly curved inside and out. The bezel is high, on the ventral corner the margin is extended into a rounded lobe (fig. 4, *b*). The embolic division consists of an irregular plate which is prolonged mesally into a narrow point reaching the tegulum (fig. 5, *a*); ventrally this prolongation is provided with a thin rounded lobe (fig. 5, *b*), apically the sclerite is rounded and grooved longitudinally with a blunt brownish tooth on the mesal margin which contains the opening of the ejaculatory duct. The ventral angle of the sclerite is prolonged into a curved, black, double-pointed tooth (fig. 5, *c*). The median apophysis is a minute, black-pointed tooth lying behind the embolic division.

Female. Length, 1.2 mm. Similar to male in form and color. Epigynum a convex transverse lobe produced behind into a broad triangular process (fig. 6).

Holotype male, *allotype* female.

CALIFORNIA: Berkeley, Jan. 1920, 2 ♂ 1 ♀, Nov. 1919, 2 ♂ 1 ♀. Dec., 1919, 1 ♂, H. Dietrich coll.

Hilaira balia n. sp.

Figures 7-11

Male. Length, 3.7 mm. Cephalothorax bright yellow-orange with darker radiating lines; viewed from above long, rounded on the sides, rounded tapering towards the front, slightly constricted at the cervical groove, the head elevated and projecting forward, nearly square across the eyes; viewed from the side gently curved over the back to the posterior eyes. Clypeus concave and retreating.

Posterior eyes in a slightly procurved line, equal, the median separated by the diameter and a little farther from the lateral. Anterior eyes, in a slightly recurved line, the median smaller than the lateral, separated by the radius and from the lateral by a little more than the diameter.

Clypeus wider than the median ocular area. The head is square in front and when viewed from above the lateral and anterior median eyes are seen in profile. There is a median row of stiff hairs from the median furrow to the eyes and back of each posterior eye is a row of two hairs. There is also a double curved row on each following the contour of the head back from the inner margin of the

posterior lateral eyes. Median ocular bears long stiff hairs as follows: a transverse row of five hairs back of anterior median eyes; two hairs on each side between the posterior median and lateral eyes. There is a single stiff hair on the clypeus below the anterior median eyes.

Sternum golden-yellow with a tinge of dusky, sparsely clothed with long black hairs, convex, longer than broad, sides evenly rounded, convergent behind, produced in a truncate point between the hind coxae which are separated by a little more than half the diameter. Labium and endites the same color as the sternum. Chelicerae orange-yellow, rather long, divergent, slightly concave on the outside near the tip; upper margin of the furrow armed with five teeth, lower margin with three or four very small teeth. No tooth on the face of the chelicera. Legs orange-yellow. Abdomen gray, lighter on the anterior third followed by two pairs of large irregular light spots back of which there are three light bars; under side gray with the two usual light lines.

Femur of palpus moderately long, cylindrical, slightly curved. Patella short, moderately arched above. Ratio of length of femur to that of patella as 25 to 7. Tibia longer than patella, evenly widened distally. The dorso-lateral margin is broadly, obliquely truncated; the edge gently concave. The margin is thickened but farther back it is very thin and transparent. The lateral surface of the tarsus is clothed with a number of long stiff hairs directed forward. The lateral margin of the cymbium excavated at the base of the paracymbium and provided with a long, rounded branch which reaches to the tegulum. At the base of the branch on the proximal side there is a sharp notch in the edge of the cymbium. The paracymbium is very large and strongly curved the base is turned up next to the branch of the cymbium. The terminal part seen ventrally is broadly lunate, with a bluntly rounded tip. The bezel is moderately high and evenly rounded on the edge (fig. 9, *b*). On the mesal side there is a saddle-shaped depression in the edge of the tegulum, in which lies the embolic division. The embolic division consists of a large irregular, more or less triangular scaphium. On the ventral side of the bulb it extends down on the tegulum to the subtegulum as a broad, slightly convex, round-pointed plate; on the mesal side it reaches to the edges of the cymbium as a carinate, rounded lobe (the anterior tooth fig. 9, *a. t.*); on the lateral side next to the bezel the outer margin is thin and flat and the inner margin is turned up into a black-edged finely denticulate keel (the posterior tooth fig. 9, *p. t.*); on the inner side of the tip of this lobe is a short acute process, the embolus. Between the mesal and lateral lobe is a very long, basally broad, apically slender process (*m.t.*) the end of which is gradually widened and the tip finely denticulate. The edge of this process is continuous with the keel on the mesal lobe. This seems to be homologous with the median tooth. The median apophysis (*m.a.*) appears as a large, squarely angulate plate. It has a branch which appears as a flat, rounded tooth between the embolic division and the edge of the cymbium.

Female. Length 3.5 mm. Similar to the male in form and color. The light markings on the back of the abdomen are more distinct and there are three pairs of spots decreasing in size posteriorly; back of these there are three or four bars. The epigynum (figures 7 & 8) is very protuberant, flattened tubular in cross-section with the hind margin thickened and strongly reflexed. At the tip

the sides do not come together beneath, having a broad, deep notch over which the reddish, triangular middle lobe may be seen.

Holotype male, *allotype* female.

CHILE: Butalcura, Chilce Id., Apr. 5, 1920.

The drawings were made by W. J. Schoonmaker of the New York State Museum, Albany, N. Y.

NOTES ON SOME DIURNAL LEPIDOPTERA FROM YELLOWSTONE PARK AND THE ADJACENT REGIONS OF MONTANA.*

BY J. MCDUNNOUGH,
Ottawa, Ont.

The following notes were compiled while working over a collection of Lepidoptera taken by me in the Yellowstone Park, Wyoming and the Upper Gallatin Canyon, Montana during the latter half of July and the first part of August of the summer of 1928.

Oeneis jutta reducta var. nov.

As compared with typical *jutta* this Rocky Mountain race is characterized in the male sex by the almost entire loss of the ocelli on both upper and undersides; the ochreous-brown marginal band is much broader and more continuous than usual and contains a minute black dot above vein five and frequently a similar one above vein two; on the hindwings there is a similar dot before the anal angle. The underside of the forewings is light brown, shading into ochreous-brown towards outer margin with the apex of wing marbled with smoky brown and white and the minute black dots of the upper side repeated; the secondaries are very evenly marbled with white and smoky brown and show no trace whatever of any central banding; the anal spot of the upperside is scarcely distinguishable. In the females the spots in the pale marginal band of the forewing are better developed, as large as in typical *jutta* and three in number; on the hindwing the anal spot is only slightly larger than in the male. The underside of secondaries is as in the male sex.

I first ran across this distinct race on the Continental Divide of the Yellowstone Park, capturing a single specimen flying along with *O. chryxus*. Later I found it not uncommon, but considerably worn, in the Upper Gallatin Canyon, frequenting open spaces in the woods on top of the lower hills, also in the company of *chryxus*. The male genitalia show certain slight differences from those of *jutta;* the apical teeth on the dorsal side of the clasper are smaller and the ventral edge is more excavated apically, leaving the distal end of the clasper projecting in the form of a rod.

Holotype—♂, Upper Gallatin Canyon, Mont., Aug. 1, (J. McDunnough); No. 2955 in the Canadian National Collection, Ottawa.

Allotype—♀, same locality, Aug. 6.

Paratypes—2♂, 1♀, same data; 1♂, Continental Divide, Yellowstone Park Wyo.; 1♀, Yellowstone Riv. Region, Yellowstone National Park, Wyo., July 24, (J. McDunnough).

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*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

Erebia sofia Stkr. This species was described from a single badly crushed female from the Fort Churchill region, Hudson Bay. Holland, evidently overlooking the type locality and accepting the Coloradan and Wyoming form as typical, redescribed the species under the varietal name *alaskensis* from a number of males, in which sex the brown spots are less evident than in the females. Further comments on the species were made by Gibson in the "Report of the Canadian Arctic Expedition," Vol. iii, Part i, p. 19.

I believe that *alaskensis* Holl. should sink to *sofia* Stkr. or be retained only as a very minor variety and that *ethela* Edw. should be used in a varietal sense for the Yellowstone Park race, characterized by the greater extent of the brown spotting on the upper side and the better defined pale yellow spots on the underside of secondaries. I took a long series of very perfect specimens in the Park during the last week of July.

Brenthis kriemhild Stkr. In a recent paper (Ann. Carn. Mus., xix, 38) Dr. W. J. Holland claims that this species is a mere race of the European *euphrosyne*. Unless he has misidentified *kriemhild* it is a puzzle to me to understand how he arrives at this conclusion for *euphrosyne* shows a marginal row of silver spots on the hindwing which is entirely lacking in *kriemhild*. This feature of the latter species was pointed out by Dr. Skinner in his redescription of the species under the name *laurenti* (1913, Ent. News, xxiv, 450). In this connection it might be well to point out that Dr. Holland has fallen into a further error in stating (*op. cit.*, *p.* 37) that "Barnes and McDunnough sink this (*laurenti*) as a synonym of *B. andersoni* Dyar." We never made any such reference but we did (1914, Ent. News, xxv, 323) suggest that *laurenti* fell to *kriemhild*, and this was concurred in by Dr. Skinner himself (p. 324) and followed in our 1917 Check List and in the more recent one by Barnes and Benjamin. *Kriemhild* is not uncommon in the Yellowstone Park, Wyo. in July; the males were mostly over before my arrival but I succeeded in securing a good series of females and still consider the species to be a valid one.

Brenthis helena ingens B. & McD. A few specimens were taken near the Continental Divide in Yellowstone Park on July 23 and others in the Upper Gallatin Canyon, Mont. at 7000 ft. elevation early in August. The species frequents open spaces on the wooded slopes or in the valley bottoms and is easily captured on the flowers of *Senecio*. A point that was not mentioned in the original diagnosis is that, in comparison with typical *helena*, the black maculation of both sides of the primaries is much heavier and the spot in the cell of secondaries near base always well-developed; in this respect *ingens* approaches close to the form of *chariclea* found in the Canadian Rockies. *Ingens* was described as a race of *helena* but there is quite a possibility of its being a good species, closer to *chariclea* than to *helena*. The single slides I have made of the male genitalia of all three forms show certain small differences, which, if constant in a series, should settle the matter; further study is however necessary before any definite opinion can be stated.

Argynnis nevadensis gallatini var. nov.

In the Upper Gallatin Canyon at about 7000 ft. I captured a number of specimens which differ from all other described forms or races in the pale color of the upper side which is a very light brown shading into pale ochreous, this

latter color being especially evident in the submarginal spots on both wings and the postmedian spots of the hindwing. Several of my specimens appear very fresh so this paler color can hardly be due to bleaching through age; in slightly worn specimens, in fact, the above mentioned spots appear almost white and one or two even show distinct traces of silvering. The female is still paler, notably on the forewing. The underside is much as in the variety *calgariana* McD. and the green of the secondaries is the same shade.

All the specimens were captured at flowers along with other Argynnid species in a small open space on top of a heavily wooded knoll.

Holotype.— ♂, Elkhorn Ranch, Upper Gallatin Canyon, Mont., Aug. 1, (J. McDunnough); No. 2954 in the Canadian National Collection, Ottawa.

Allotype.— ♀, same locality, Aug. 3.

Paratypes.—9 ♂, same locality, Aug. 1, 6.

Argynnis montivaga owcni Edw. A series of specimens taken along with *nevadensis gallatini* has puzzled me considerably to place but I have finally decided that they come closer to *owcni* than to any other form. The upperside of the male as compared with Holland's' figure (Butt. Book, Pl. xii, f. 5) and Wright's (Butt. Calif. Pl. xiii, fig. 116) is generally considerably darker but on the other hand my series fits in quite well with Comstock's figure (Butt. Calif. Pl. xxx, fig. 10) which is probably taken from topotypical material; in size my specimens average somewhat smaller than Holland's male. The undersides of the secondaries are quite variable in depth of coloration but none are as bright as Holland's fig. 6 and are generally a dull purple-brown more or less suffused with ochreous and with, at times, some greenish scaling in the basal area; they match very closely Comstock's fig. 5 of Plate xxiv, listed as *hippolyta*, but which can scarcely be this species, characterized as it is by a bright red-brown underside as in *bremneri*. This specimen, without data, was loaned by Dr. Barnes and is quite likely one of the Idaho specimens mentioned (Ent. News, xi, 328) as intergrading between *owcni* and *hippolyta;* at that time this latter species was imperfectly known to most collectors and the status of the species was only correctly determined in our "Contributions," iii, 76. In this connection it might be well to state that Comstock's other figures of *hippolyta* (Pl. xxvi, figs. 7, 8) are very doubtful but that Holland's figure (Pl. xii, fig. 10) has evidently been made from one of the type lot and matches well with a specimen in the Canadian National Collection originally sent by Edwards to Captain Gamble-Geddes, bearing his label "*hippolyta*, Oregon" and probably one of the original Dodge lot. The similarity of the upper sides was, I imagine, the cause of the association of *owcni* with *hippolyta* by Barnes, Wright and others but the distinctive coloring of the underside hardly, to my mind, warrants this reference and I still incline to the view that *owcni* shows more affinity to *montivaga* than to any other species.

Two specimens of my above-mentioned series show unsilvered spotting on the underside of secondaries and are possibly referable to *cottlei* Comst. which is figured in the "Butterflies of California," Plate xxvi, fig. 2; the author states that it may prove to be an unsilvered form of *hippolyta* but the chances to my mind are more in favor of a reference to *owcni*.

SOME NEW SPECIES OF COLEOPTERA.*

BY W. J. BROWN,
Ottawa, Ont.

Hydrochus currani n. sp.

Length 2.5-3.4 mm.; width 1.2-1.4 mm. Short and robust. Dorsum dark brown, scarcely bronzed; head, pronotum and elytral intervals with closely placed, round, green spots; venter dark reddish brown; legs brown, the femora dark, the tibiae and tarsi pale.

Head roughly punctate and granulate. Pronotum very slightly wider than long; widest near apex, gradually narrowed to base, the sides feebly crenate, feebly sinuate at middle; front angles obtuse, very broadly rounded; hind angles obtuse, distinct. Pronotal disk roughly and very coarsely punctate, closely granulate; with a large circular median fovea the bottom of which is smooth, a vague depression on each side, a small but deep fovea near each hind angle.

Elytra at base wider than the prothorax, widest and somewhat inflated at middle, the sides oblique in basal half, broadly arcuate in apical half. Striae closely and coarsely punctured; the intervals narrower than the strial punctures, feebly and uniformly elevated above them.

Holotype.— ♂, Ottawa, Ont., April 20, 1927, (C. H. Curran); No. 2872 in the Canadian National Collection, Ottawa.

Paratypes.—9, Britannia, Ont., May 18, 1927, (G. S. Walley) and June 8, 1928, (W. J. Brown).

This species is distinguished by its robust form and simple elytral intervals. In form it approaches *scabratus* but is slightly more robust than that species. It is very different from the other described species.

Plateros columbiensis n. sp.

Length 7-8 mm.; width 2.3-2.7 mm. Elongate and rather slender; black, pronotum with lateral margins broadly and often apical margins narrowly pale red, humeri pale red.

Antennae slightly more than half as long as the body; distinctly serrate, more strongly so in the male. Pronotum somewhat variable in form; from two-thirds to three-fourths as long as wide; the apical margin entire; the side margins more or less sinuate and oblique before the hind angles; basal margin with a small but very distinct median emargination; disk without apical carina; median sulcus confined to basal third or two-fifths, moderately wide. Elytra with alternate lines much more strongly elevated, the more feeble lines very feeble near apex, much more strongly elevated at base.

Male. Second antennal segment transverse; third as wide as long; the fourth very slightly longer than wide, equal in width to the third; fifth almost as long as the fourth, slightly narrower; segments three to nine triangular, the outer apical angle acute, the distal side oblique.

Female. Antennae stouter, less strongly serrate. Pronotum larger.

Holotype.— ♂, Brookmere, B. C., May 25, 1924, (R. D. Bird); No. 2873 in the Canadian National Collection, Ottawa.

Allotype.— ♀, same data as holotype.

*—Contribution from the Division of Systematic Entomology, Entomologcial Branch, Dept. of Agric., Ottawa.

Paratypes.—3 ♂, same data as holotype.

This species traces to *sollicitus* in Leconte's table (Trans. Am. Ent. Soc. IX, 27). It is distinguihed from its allies by the narrow form, emarginate pronotal base, unequal elytral lines, and antennal characters. The individuals of the type series are quite constant in these characters.

Ptinus ocellus n. sp.

Length 2.5-3.6 mm.; width 1.33-1.75 mm. Rather broadly oval; integuments reddish brown throughout, densely clothed with reddish-yellow hairs; immaculate. Head feebly shining, densely and coarsely punctate; clothed with dense hairs; eyes very small and very prominent, hemispherical in form, separated on the front by a distance 3.3 times as great as the vertical diameter and almost equal to the length of the first three antennal segments. Antennae two-thirds as long as the body; first segment stoutest, feebly arcuate; the second triangular, a little shorter than the third; the third to the tenth subequal in length, gradually becoming less triangular and more subcylindrical apically; the eleventh one-third longer than the tenth, bluntly pointed at apex.

Prothorax slightly wider than the head across the eyes; as wide as long; the side parallel for a short distance behind apex, then strongly convex to the strong basal constriction. Disk shining, not tuberculate, coarsely and closely punctate; clothed with dense, appressed reddish-yellow hairs and with numerous longer, coarse, suberect, brown hairs, a patch of longer reddish-yellow hairs on each side just before and another just behind the basal contriction; median line not impressed, without sculpture or vestiture.

Elytra broadly oval, the sides moderately arcuate; humeri broadly rounded, distinct. Striae feebly impressed, coarsely punctured, the punctures without setae. Intervals feebly convex, fully three times as wide as the striae, densely clothed with reddish-yellow, appressed hairs and each with a median row of longer, suberect hairs of the same shade; the vestiture uniform throughout in color and distribution.

Prosternal process narrow; mesosternal process about two thirds as wide as the coxa. Metasternum with dense, appressed hairs similar to those of the elytra, coarsely punctate, very slightly longer than the second ventral segment. Abdomen clothed like the metasternum; third and fifth segments equal, the fourth half as long as either; sutures distinct. First segment of hind tarsus equal in length to the two following.

Secondary sexual characters absent.

Holotype.— ♂, Victoria, B. C., July 5, 1928, infesting fish meal, (W. Downes); No. 2874 in the Canadian National Collection, Ottawa.

Allotype.— ♀, same data.

Paratypes.—48, Victoria, B. C., August 10, 1927 and July 5, 1928, infesting fish meal, (W. Downes).

This species is not closely allied to any previously described. It may be readily known by the immaculate elytra, lack of sexual characters, and the very small, widely separated eyes; this last is a remarkable character and will separate the species from all previously known from North America. The species seems to possess some of the characters of *Niptinus* but must be excluded from that genus on account of the strongly constricted prothorax and the free abdominal segments.

Orchestes uniformis n. sp.

Length 2.5-2.8 mm.; width 1.2-1.4 mm. Black, antennae and tarsi brown; clothed with sparse, long, coarse, conspicuous hairs.

Beak moderately robust, slightly shorter than the prothorax, feebly carinate just before the eyes, very finely striate between the antennal grooves, the median line smooth and the sides coarsely punctured in apical half. Antennal funicle six-segmented. Head coarsely and densely punctured, each puncture bearing a hair.

Pronotum two-thirds as long as wide; the sides parallel in basal half, then rounded and converging to apex; disk with a faint median basal impression, closely and very coarsely punctured, each puncture bearing a hair, the intervals between the punctures smooth. Scutellum with a few hairs, not more closely clothed than the pronotum or elytra.

Elytra elongate-oval, at base one-half wider than the pronotum; humeri rounded, not prominent; the sides feebly arcuate, strongly so near apex. Elytral striae with deep punctures, each punctures with a depressed hair. Intervals impunctate, with few rugae; each with one or two irregular rows of semi-erect hairs, these uniform in color and distribution.

Ventral surface and legs clothed with hairs, these sparser on abdomen except at sides and apex, equally distributed elsewhere. Metasternum and abdomen coarsely and closely punctured. Hind femora strongly thickened.

Holotype.—Aweme, Manitoba, May 28, 1925, (R. M. White); No. 2875 in the Canadian National Collection, Ottawa.

Paratype—1, same data, June 4, 1923.

This species is allied to *pallicornis* and *canus*. It agrees with the former in form, the elytra being less attenuate at apex than in the latter. The pubescence of *uniformis* is similar to that of *canus* in coarseness and abundance. In *uniformis* the pubescence is uniform in color and is not dense on the scutellum. The species resembles *illinoisensis* closely, but in the latter the antennal funicle is seven-segmented and the scutellum is densely pubescent.

NEW CANADIAN ANTHOMYIDS BELONGING TO THE GENUS HYLEMYIA ROB.-DESV. (MUSCIDAE, DIPTERA).

BY H. C. HUCKETT,
Riverhead, N.Y.

(Continued from page 96)

Hylemyia pentaformis sp. nov.

Male blackish; head with frontal vitta opaque black, faintly tinged with red at base of antennae; parafacials and cheeks grayish pruinescent with reddish to black reflections; antennae and palpi black; arista paler on distal portion. Thorax and abdomen subshining with dark reflections, the former lightly brownish pollinose, viewed from behind with three faint, narrow vittae; the latter more densely pollinose, each tergum with a broad black subtriangular mark, hypopygium shining. Legs blackish. Wings tinged, more intensively basad, but not blackened; veins dark brown. Calyptrae tinged, halteres yellow.

Head with eyes separated at narrowest by a distance slightly greater than diameter of anterior ocellus, the frontal vitta separating the parafrontals throughout their extent, cruciate setulae present; parafrontals with four pairs of

bristles; arista with longest hairs about equal to half breadth of third antennal segment; cheeks equal in breadth to that of third antennal segment, marginal bristles confined in single series: palpi filiform and slender. Thorax with acrostical bristles sparsely arranged in an irregular series, the presutural bristles stronger than those postsutural; prealar shorter than posterior notopleural bristle; posthumeral bristle weakly duplicated; sternopleurals, 2 or 3:3, the ventral bristles much weaker than remainder. Abdomen depressed, elongate, tapering caudad; terga more densely bristled along their lateral margins; hypopygium conspicuous, basal segment well developed, resembling an additional abdominal tergum; processes of fifth sternum with clothing of fine hairs on inner border, otherwise strongly bristled, especially apicad; each sternum is shorter than its respective tergum, and is broader than long, thus tending to foreshorten the normal extension of ventral surface.

Fore femur armed with a series of stout posteroventral bristles; fore tibia with or without a median anterodorsal bristle, and with a median posteroventral bristle; apical posteroventral bristle fine and pointed; mid femur with a series of weak anteroventral bristles, the basal 2 or 3 erect, remainder appressed; posteroventral surface with 2 to 4 strong bristles on proximal half; mid tibia with 1 median anteroventral, 1 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles: hind femur with a series of strong anteroventral bristles, increasing in length proximad, the posteroventral surface with a series of weaker bristles for nearly its entire extent; hind tibia with 4 to 6 anteroventral, 4 or 5 anterodorsal, 3 posterodorsal bristles, and a series of 10 to 16 posteroventral setulae, most of which at least equal in length the diameter of tibia. Tarsi with claws strong and pulvilli large, especially those of fore tarsi. Wings with costal thorn strong; *r-m* cross vein slightly sinuate; veins R_{4+5} and M_{1+2} nearly parallel to wing margin.

Female paler in color than male, densely grayish pollinose, thorax and abdomen obscurely vittate, the latter tinged with a brownish caste. Head with frontal vitta reddish, blackened caudad. Wings hyaline, veins yellowish, especially basad: calyptrae whitish, halteres pale yellow. Cerci of ovipositor with many hairs stiffened and straight, not flexible; fore tibia with 1 median anterodorsal and 1 posteroventral bristle: mid femur with a strong basal bristle on anteroventral surface, posteroventral surface with 2 proximal bristles; mid tibia with 1 median anteroventral, 1 anterodorsal, 2 posterodorsal and 2 posteroventral bristles, the anterodorsal bristle much stouter than remainder: hind femur with 5 strong anteroventral bristles, posteroventral surface bare except for normal apical and basal bristles; hind tibia with 2 or 3 anteroventral, 4 anterodorsal, and 3 posterodorsal bristles, posterior surface bare. Wings with *m-cu* cross vein almost straight; costal thorn strong, the setulae conspicuously developed. Length, 5.25-5.75 mm.

Records:—1 ♀ Banff, Alta., June 9, 1922; 1 ♂ June 16, 1922; 2 ♀ June 18, 1922; 2 ♂ July 23, 1922; 1 ♀ July 25, 1927; 1 ♂ July 26, 1922; 2 ♂ July 27, 1922; 1 ♂ July 29, 1922; 1 ♂ July 30, 1922; 1 ♂ 1 ♀ Aug. 18, 1922; 1 ♀ Aug. 25, 1922; 4 ♂ 1 ♀ Aug. 29, 1922; 1 ♂ 3 ♀ Sept. 11, 1922; 1 ♀ Sept. 13, 1922; 1 ♂ 2 ♀ Sept. 23, 1922 (C. B. D. Garrett); 2 ♂ 1 ♀ Waterton, Alta., July 11, 1923; 1 ♀ July 9, 1923; 1 ♂ July 13, 1923; 1 ♂ 1 ♀ Aug. 13, 1922 (H. L. Sea-

mans); 12 ♂ 4 ♀ Rolla, B. C., July 1, 1927; 1 ♂ July 11, 1927; 2 ♂ 5 ♀ July 14, 1927 (P. N. Vroom); 4 ♀ Crows Nest, B.C., July 26, 1926 (A. A. Dennys); 1 ♂ Nordegg, Alta., July 5, 1921 (J. McDunnough); 1 ♂ Bearberry Creek, near Sundre, Alta., July 23, 1926 (C. H. Young); 1 ♀ Lilloet, B. C., July 1, 1925 (A. P. Macdougall); 1 ♀ Chilcotin, B. C., Sept. 1, 1920 (E. R. Buckell).

Type, allotypes and *paratypes*, No. 2915 in Canadian National Collection.

In certain respects the form and bristling of the male varies. For instance the eyes may be separated by a distance nearly equal to breadth between posterior ocelli; the parafrontals at base of antennae may be slightly narrower or broader than width of third antennal segment; the presutural acrostical bristles may be regularly paired. The species may however be readily recognized in the male by the series of strong bristles on hind femur, which increase in length proximad, and in the female by the presence of a strong basal anteroventral bristle on mid femur and by the stiff hairs on the apical processes of ovipositor.

Hylemyia repleta sp. nov.

Male blackish; head with frontal vitta black, occasionally with reddish tinge cephalad; parafrontals, parafacials, and cheeks silvery pruinescent; antennae and palpi black. Thorax and abdomen subshining, with blackish reflections; viewed from behind, the former with three narrow obscure vittae, humeral and notopleural areas of lighter shade; the latter with terga 1, 2, and 3 whitish pollinose, each segment having a black dorsocentral vitta which fuses cephalad with the incisures, terga 4 and 5, and hypopygium shining, fuscous, with no definite markings, the latter becoming polished and glossy ventrad. Legs black, subshining; pulvilli tinged; calyptrae white; wings infuscated, more densely so basad, but not blackened. Veins chocolate brown; halteres with knobs blackened.

Head with eyes separated at narrowest by a distance not exceeding that between posterior ocelli; frontal vitta separating the parafrontals throughout their extent, and narrowly expanding cephalad, cruciate setulae present; parafrontals in profile prominent, with five pairs of bristles and a minute pair placed immediately cephalad of anterior ocellus; parafacials at base of antennae slightly wider than breadth of third antennal segment, narrowing slightly ventrad; cheeks narrowed caudad, at widest equal to breadth of parafacial at base of antennae, marginal bristles in single series; third antennal segment 1.25 times length of second; arista with microscopic pubescence; palpi short, in length about equal to distance between oral vibrissae; proboscis glossy. Thorax with acrosticals in an irregular single series, if paired the bristles very closely approximate one another; posthumeral bristle duplicated; prealar bristle as long as posterior notopleural bristle; sternopleural bristles, 2 or 3; 3, the ventral bristles weak. Abdomen depressed basad, considerably swollen on the caudal half; hypopygium large, the basal sclerites conspicuous, processes of fifth sternum with a series of fine sparsely set hairs on inner margin, and a series of 4 or 5 black, short, blunt bristles at apex, the inner border with only a few fine hairs, the outer border with stiff bristles which increase in length apicad.

Fore tibia with a median posteroventral bristle and a stout blunt apical posteroventral bristle: mid femur with a series of short anteroventral bristles which become weaker apicad, and 5 or 6 not very strong posteroventral bristles on

proximal half; mid tibia with 2 anteroventral, 1 anterodorsal, 1 posterodorsal, 1 or 2 posteroventral and 1 posterior bristle on apical third which is somewnat stouter than the other mid tibial bristles: hind femur with 2 or 3 series of long bristles on the proximal half of anteroventral surface, which increase in size distad, the remainder of the anteroventral surface bare except for one preapical bristle, posteroventral surface with a series of long fine bristles on proximal half and 1 or 2 preapical bristles; hind tibia with 6 or 7 anteroventral, 5 or 6 alternately long and short anterodorsal, 5 to 7 alternately long and short posterodorsal bristles, and a series of 7 to 9 strong posteroventral setulae. Mid tarsi shorter than mid tibiae. Wings with costal thorns strong, costal setulae noticeably developed: veins R_{4+5} and M_{1+2} subparallel; *m-cu* cross veins straight.

Female very closely resembles that of *occidentalis* Mall. Paler in color than male, densely cinerous pollinose, abdomen with slightly darker caste than thorax. Thorax with an obscure median vitta, abdomen nonvittate. Frontal vitta reddish, blackened caudad. Wings hyaline, veins yellowish; calyptrae tinged, halteres yellow.

Third antennal segment 1.75 times length of second; arista densely short pubescent, longest hairs about equal to diameter of base of arista. Proboscis normal, not fleshy. Acrosticals in an irregular single series; posthumeral bristle weakly duplicated: prealar bristle as long as posterior notopleural bristle; sternopleurals, 2:3.

Fore tibia with 1 median anterodorsal and 1 posterodorsal bristle: mid femur with 1 strong basal and a series of weak anteroventral bristles; posteroventral surface with 3 or 4 proximal bristles; mid tibia with 1 anteroventral, 1 or 2 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles: hind femur with 5 anteroventral and 2 or 3 weak bristles on median third of posteroventral surface; hind tibia with 2 or 3 anteroventral, 4 anterodorsal, and 3 posterodorsal bristles. Wings with costal thorn strong, veins R_{4+5} and M_{1+2} subparallel, *r-m* cross veins straight. Length, 5.5 mm.

Records:—3 ♂ 1 ♀ Banff, Alta., May 5, 1922; 1 ♂ June 27, 1922 (C. B. D. Garrett); 1 ♂ Nordegg, Alta., July 5, 1921 (J. McDunnough).

Type, allotype and *paratypes* No. 2916 in Canadian National Collection.

The male may be readily recognized by the characteristic bristling of the hind femur and by the large hypopygium. The female closely resembles that of *occidentalis* Mall. but may be separated by the following characters:—the presence of a strong basal bristle on anteroventral surface of mid femur, and of weak bristles on posteroventral surface of hind femur; the proboscis is not fleshy and swollen; the acrosticals are uniserial; and the arista is densely short pubescent.

Hylemyia mutans sp. nov.

Male blackish, with whitish pruinescence; head with frontal vitta black, reddish tinged cephalad; palpi and antennae black; thorax with disc of mesonotum and scutellum grayish drab, the former with three narrow vittae; abdomen somewhat greased in specimen, but there is apparently a black dorsocentral vitta which merges cephalad with the black, narrow tergal incisures. Legs black; pulvilli tinged. Wings faintly and uniformly tinged throughout; veins brownish; calyptrae whitish; halteres yellow.

Head with eyes separated at narrowest by a distance slightly greater than length of third antennal segment; frontal vitta of nearly uniform breadth throughout, equal in distance to twice that between posterior ocelli; parafrontal bristles rather weak and slender, cruciate setulae present; parafacials, parafrontals and cheeks in profile broad and prominent, exceeding width of third antennal segment: antennae with second segment short, in length equal to about half that of third antennal segment: arista with microscopic pubescence, swollen at base. Thorax with three pairs of closely set presutural acrosticals of which the middle pair is stouter developed; prealar bristle as long as posterior notopleural bristle; sternopleural bristles, 2:3, the ventral bristles weaker than remainder. Abdomen depressed, slender, gradually narrowed caudad; processes of fifth sternum with a few scattered hairs on inner border and a few bristles on outer border.

Fore tibia with 1 median posteroventral and a well developed pointed apical posteroventral bristle: mid femur with a series of short appressed bristles on anteroventral surface which become weaker apicad; posteroventral surface with 6 or 7 bristles on proximal two-thirds: mid tibia with a weak, short, anterior, 1 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles: hind femur with a series of about 12 short anteroventral bristles, of which the apical bristle is much stouter developed, the remainder not equal in length to width of femur, posteroventral surface bare except for 3 or 4 short, well developed setulae on median third; hind tibia with 5 anteroventral, 4 uniformly short anterodorsal, 3 or 4 posterodorsal bristles, and 1 or 2 obscure setae on median third of posterior surface. Mid tarsus slightly shorter than mid tibia; all pulvilli shorter than their respective claws. Wings with costal thorn short; veins R_{4+5} and M_{1+2} subparallel; *m-cu* cross vein nearly straight. Length 5·5 mm.

Records:—1 ♂ Brooks, Alta., May 30, 1923 (Walter Carter).

Type.—No. 2917 Canadian National Collection.

This species may be included among those of this genus in which the male possesses a broad frontal vitta, resembling in this respect *coenosiaeformis* Stein, *latifrontalis* Huck., and *equifrons* Huck. (*vide infra*).

Hylemyia impersonata sp. nov.

Male very closely resembles that of *trivittata* Stein; parafacials and cheeks deep velvety black with whitish pruinescence; antennae and palpi black; thorax viewed from behind, with well marked median and lateral vittae, the latter much broader than former; from in front, with black reflections: abdomen densely yellowish pollinose, dorsocentral vitta composed of elongate subtriangular marks on each tergum, viewed from in front with dark reflections; hypopygium blackish. Legs black. Wings tinged with yellowish brown, more intensively basad. Calyptrae dusky; halteres yellow.

Head with eyes separated at narrowest by a distance slightly greater than that between posterior ocelli inclusive; frontal vitta prominent, broad, separating the parafrontals at narrowest by a ribband-like stripe: parafacials and cheeks in profile broad and prominent, exceeding in width the breadth of third antennal segment, marginal bristles of cheeks in two series; arista short pubescent, longest hairs at most equal in length to diameter at base of arista; oral margin in profile slightly produced; palpi and proboscis slender. Thorax with 2 or 3 pairs of presutural acrosticals; prealar bristles longer than posterior notopleural bristles;

posthumeral bristle weakly duplicated; sternopleural bristles, 2:3. Abdomen depressed, narrowly conical; processes of fifth sternum with a dense fringe of fine setulae on inner border which become shorter apicad, the outer border with a scattered series of bristles.

Fore tibia with a median anterodorsal and posteroventral bristle, apical posteroventral bristle fine and pointed: mid femur with 1 basal anteroventral bristle and 2 or 3 bristles on proximal half of posteroventral surface; mid tibia with or without a fine short median anteroventral bristle, 1 anterodorsal, 1 posterodorsal, and 2 posteroventral bristles: hind femur with a complete series of anteroventral bristles, and 3 or 4 posteroventral bristles on proximal half; hind tibia with 2 or 3 anteroventral, 5 anterodorsal, 3 posterodorsal bristles, and a few semierect setulae on median third of posteroventral surface. Wings with costal thorn short: veins R_{4+5} and M_{1+2} subparallel; *m-cu* cross vein slightly sinuate. Length, 5.75 mm.

Records:—1 ♂ Transcona, Man., June 9 1926; 1 ♂ July 26, 1927; 1 ♂ July 29, 1927 (G. S. Brooks).

Type and paratype.—No. 2918 in Canadian National Collection.

The above specimens very closely resemble *trivittata* Stein in appearance and chaetotaxy, having in common three well marked vittae on thorax; dense yellowish gray pollen on abdomen; and yellowish wings. They differ however in having the legs black, the tibiae at most very obscurely reddish; the parafacials and cheeks broader than width of third antennal segment; and differences in the form of the genitalia.

Hylemyia neomexicana Mall.

Records:—2 ♂ Banff, Alta., Aug. 2, 1922 (7600 ft.); 2 ♂ 3 ♀ Aug. 9, 1922 (7700 ft.); 1 ♂ June 29, 1922; 1 ♂ 1 ♀ Aug. 29, 1922; 11 ♂ Aug. 7, 1922; 2 ♂ Aug. 3, 1922 (8000 ft.); 1 ♂ 1 ♀ July 6, 1922; 3 ♂ 2 ♀ Sept. 7, 1922; 1 ♂ Sept. 23, 1922; 2 ♂ 1 ♀ Aug. 29, 1922; 1 ♀ July 25, 1922; 1 ♀ Aug. 30, 1922; 1 ♀ Aug. 21, 1922; 1 ♀ Aug. 25, 1922; 1 ♀ July 7, 1922; 1 ♀ July 23, 1922; 3 ♀ Sept. 23, 1922; 1 ♀ Sept. 25, 1922; 2 ♀ Sept. 5, 1922; 1 ♀ Aug. 24, 1922; 1 ♂ Keremeos, B. C., June 20, 1923; 3 ♂ June 21, 1923; 2 ♂ 2 ♀ June 23, 1923; 1 ♂ July 10, 1923; 1 ♂ June 26, 1923; 1 ♂ July 10, 1923; 1 ♀ Hedley, B.C., July 5, 1923 (all collected by C. B. D. Garrett). 2 ♀ 1 ♂ Waterton, Alta., July 11, 1923; 1 ♂ July 14, 1923; 1 ♂ June 19, 1923; 1 ♂ July 1, 1923; 1 ♂ 3 ♀ July 13, 1923; 1 ♂ July 17, 1923; 1 ♀ July 9, 1923; 1 ♀ July 12, 1923; 1 ♀ June 24, 1923; 1 ♀ July 8, 1923; 1 ♀ Lethbridge, Alta., Sept. 12, 1923; 1 ♂ 1 ♀ June 23, 1922; 1 ♂ June 25, 1922 (all collected by H. L. Seamans). 1 ♀ Invermere, B.C., July 28, 1926; 1 ♂ Salmon Arm, B.C., June 22, 1925; (A. A. Dennys) 1 ♀ Vernon, B.C., Sept. 22, 1927 (I. J. Ward). 1 ♀ Pincher, Alta., June 27, 1923, alfalfa leaves, (Walter Carter).

The above series of specimens vary considerably in many characters, notably in the color of the legs, the length of the prealar bristle, and in the infuscation of head and thorax. The color of the tibiae vary from yellowish to entirely black; the prealar bristle may be present or absent; the thorax may be grayish cinerous with three vittae apparent, or entirely fuscous with the vittae obscured; the head may have reddish to blackish reflections.

The species closely resembles *cerealis* Gill., from which it differs in both sexes through the lack of semierect sensory hairs on the hind tarsi, and in the form of the male copulatory appendages and ovipositor. In the male the posteroventral bristles of hind femur are much shorter and weaker than those of *cerealis*, rarely exceeding in length the width of hind femur where situated; the hind tibiae possess a double series of posteroventral setulae on basal half, a series of setulae on anterior surface, and a uniform, closely set series of setulae on anteroventral surface: whereas in *cerealis* the hind tibiae possess a single series of posteroventral setulae, and a series of anteroventral setulae which become stronger and more widely spaced apicad. In the female the mid femur has usually no bristle or only a weakly developed bristle at base on anteroventral surface, whereas in *cerealis* the basal bristle is usually well developed.

Hylemyia nigricaudata sp. nov.

Male grayish; head black, frontal vitta with traces of reddish; parafrontals and parafacials whitish pruinescent with dark reflections; second antennal segment reddish at apex, third segment black; palpi black: thorax lightly grayish pollinose, subshining, when viewed from the side with three faint vittae: abdomen densely yellowish gray pollinose except for hypopygium which is blackish and subshining; dorsocentral vitta uniformly linear, narrowly interrupted at the caudal margin of each segment: legs subshining, coxae and femora completely blackened, tibiae paler, fuscous; tarsi black, pulvilli smoky. Wings and calyptrae tinged with yellow; veins yellowish; halteres yellow.

Head small, with eyes separated at narrowest by distance equal to diameter of anterior ocellus: parafrontals with 3 or 4 pairs of bristles, cruciate setulae present: parafacials at base of antennae about equal to breadth of third antennal segment, narrowed ventrad: cheeks as wide as breadth of third antennal segment, marginal bristles strong, especially those upcurved: second antennal segment small, as wide along apical margin as its length, third antennal segment fully twice as long as second; arista pubescent, longest hairs slightly longer than half breadth of third antennal segment, swollen at base: palpi linear, slightly broadened apicad. Thorax with acrosticals sparsely arranged, two presutural pairs, one weakly the other well developed; prealar bristle short or absent; sternopleural bristles, 1 or 2: 3. Abdomen depressed, margins of segments subparallel, but little narrowed caudad; hypopygium prominent, processes of fifth sternum with an apical series of 3 short stout setulae, inner border with a few scattered hairs, outer border with a few bristles which become stronger and longer apicad. Legs more slender than usual, fore femur with the normal series of posterodorsal and posteroventral bristles and also two bristles on proximal third of posterior surface; fore tibia with a median posteroventral bristle and a blunt tipped apical posteroventral bristle: mid femur with 4 erect weak bristles at base of anteroventral surface, and 2 bristles on proximal third of posteroventral surface; mid tibia with or without an anterodorsal bristle, 1 or 2 posterodorsal, 2 posteroventral bristles, all less in length than diameter of tibia: hind femur with 3 short bristles on proximal third, and 3 bristles on apical third of anteroventral surface, with 1 prebasal bristle on posteroventral surface; hind tibiae with 4 anteroventral, 4 short anterodorsal, and 3 long posterodorsal bristles, posteroventral surface with only a short preapical setula. Wings with costal thorn of

moderate size; veins M_{1+2} and R_{4+5} subparallel, the penultimate section of vein M_{1+2} three-fourths as long as ultimate section; *m-cu* cross vein slightly sinuate. Length, 4.75 mm.

Record:—1 ♂ Waterton, Alta., July 13, 1923 (H. L. Seamans).

Type No. 2919 in Canadian National Collection.

This species agrees very closely with the description of *angustitarsis* Mall. The male may be separated by the possession of stout apical setae on inner margin of processes of fifth sternum.

Hylemyia garretti sp. nov.

Male blackish; head with parafacials and cheeks blackish to reddish with silvery pruinescence; frontal vitta blackish with reddish tinge; antennae blackish; palpi fuscous. Thorax with grayish pollen, subshining, with three brownish vittae, macrochaetae with brownish spots at base. Abodmen more densely grayish pollinose, with dark reflections; dorsocentral vitta narrowly expanded cephalad on each tergum to fuse with a darkened area along the cephalic margin. Legs blackish, subshining, apical portion of femora and basal area of tibiae yellowish: wings and calyptrae faintly tinged, veins brownish: halteres yellow.

Head with eyes separated at narrowest by a distance equal to diameter of anterior ocellus; parafrontals cephalad of ocellus very narrowly separated by frontal vitta, the latter narrowly expanding cephalad; four or five pairs of frontal bristles, cruciate setulae present: parafacials and cheeks in profile scarcely equal to breadth of third antennal segment: arista narrowly thickened proximad, longest hairs about equal to basal diameter of arista. Thorax with acrosticals irregularly paired, with three presutural pairs, unequally developed, posthumeral bristle weakly duplicated, prealar bristle short, sternopleural bristles, 1:3. Abdomen depressed, elongate, basal segments of hypopygium prominent, cerci (upper forceps) small, with a fringe of long black curling bristles; processes of fifth sternum with a few fine hairs along inner margin, and a series of 3 or 4 blunt apical setae of irregular size, remainder of surface clothed with setulae and bristles, an apical one of which is noticeably straight and somewhat stouter developed.

Legs with the fore and mid tibiae with the series of setulae on proximal half of dorsal surface more noticeably developed than usual. Fore tibia with 1 or 2 median posteroventral bristles and a stout blunt tipped apical posteroventral bristle, fourth segment of fore tarsi with or without a longish apical seta: mid femur with 3 or 4 weak anteroventral bristles on proximal third, 5 to 7 posteroventral bristles on proximal half: mid tibia with or without a very weak posterodorsal, and 2 or 3 posteroventral bristles, mid tarsi with long dorsal hairs on basal segment, with the posterior apical thorn on segments 1 to 4 stoutly developed, those of segments 3 and 4 usually long: hind femur with 5 to 7 bristles on distal half of anteroventral surface, posteroventral surface bare; hind tibia with 2 or 3 anteroventral, 4 shortish anterodorsal, 3 or 4 posterodorsal bristles, and with 1 to 5 setulae on posteroventral surface. Fore and hind tarsi longer than their respective tibiae, and compressed laterally; fore tarsal claws and pulvilli longer than those of mid and hind tarsi.

Wings with costal thorn short; veins R_{4+5} and M_{1+2} converging slightly toward wing margin; *m-cu* cross vein slightly sinuate.

Female paler in color than male; otherwise very similar except for secondary sexual characters: abdomen with an indefinite fuscous vitta; tibiae fuscous with a reddish yellow tinge; wings and calyptrae hyaline, veins yellowish brown: ovipositor with recurved hooks on caudad sclerites: fore tibia with a median anterodorsal and posteroventral bristle: mid femur with anteroventral surface bare, and three bristles on proximal half of posteroventral suface; mid tibia with 1 median anteroventral, 1 anterodorsal, 1 or 2 posterodorsal, and 2 posteroventral bristles: hind femur with 3 anteroventral bristles; hind tibia with 2 anteroventral, 3 or 4 anterodorsal, and 3 posterodorsal bristles. Length, 5.5-5.75 mm.

Records:—3 ♂ Keremeos, B. C., June 20, 1923; 1 ♂ June 21, 1923; 1 ♂ June 22, 1923; 6 ♂ 1 ♀ June 23, 1923; 1 ♂ June 25, 1923; 1 ♂ 1 ♀ June 27, 1923; 1 ♂ July 10, 1923; 1 ♂ Osoyoos, B.C., May 18, 1923; 1 ♀ May 19, 1923; 1 ♂ Hedley, B. C., July 6, 1923; 1 ♂ July 9, 1923 (C. B. D. Garrett); 1 ♂ Nordegg, Alta., July 5, 1921; 1 ♂ Mt. MacLean, Lillooet, B.C., July 11, 1926, 6000 ft. (J. McDunnough); 2 ♀ Rolla, B.C., July 1, 1927 (P. N. Vroom).

Type, allotype and *paratypes*, No. 2920 in Canadian National Collection.

Of the Keremeos specimens there are many males that are darker in color, the mesonotum being entirely and the abdomen partly densely infuscated, in the former case the vittae are entirely obscured and the wings and calyptrae are distinctly tinged. The legs are entirely blackish.

This species together with the following are closely related to *gracilipes* Mall., the males having in common a robust apical blunt posteroventral bristle on fore tibia; an abnormally well developed apical thorn on posterior surface of mid tarsal segments two to four, and a more or less longish apical setula on fourth segment of fore tarsi. The three species may however be separated by the structure of the male genitalia. The males of *garretti* and *propinquina* possess long curling hairs on dorsum of mid metatarsus, whereas in *gracilipes* such hairs are vestigial at most. Otherwise the males agree very closely in color and chaetotaxy. The females of *garretti* and *propinquina* possess recurved hooks on caudal sclerites, and stiff spinules on ventral surface of ninth segment (penultimate), whereas in *gracilipes* there are only hairs on the caudal sclerites of ovipositor and on ventral surface of ninth segment of abdomen. In *gracilipes* and *garretti* the mid and hind tibiae are largely reddish yellow, the fore tibia more or less infuscated, and the posteroventral surface of hind femur is bare, whereas in *propinquina* the tibiae are all densely infuscated, and the hind femur possesses one or two weak bristles on proximal half of posteroventral surface.

Hylemyia propinquina sp. nov.

The male is closely allied to that of *garretti*, differing most notably in the structure of the genitalia and processes of the fifth abdominal sternum. The head and tibiae are more intensively blackened.

Female blackish with dense grayish pruinescence; head with frontal vitta reddish on cephalic half and blackened caudad: antennae and palpi blackish: thorax with three brownish vittae and lateral markings; abdomen with an indefinite fuscous vitta. Legs blackish. Wings tinged; calyptrae whitish; halteres yellow.

Thorax with three pairs of presutural acrosticals, of which one pair is much stouter developed than the remaining pairs; prealar bristle short; sterno-

pleural bristles, 2: 3, the ventral bristles much weaker than the dorsal; abdomen having ovipositor with recurved hooks on anal processes and anal plate; with stiff spinules on ventral surface of ninth (penultimate) segment. Fore tibia with a median anterodorsal and posteroventral bristle; mid femur with 1 stout basal bristle on anteroventral surface, and 2 to 4 bristles on proximal half of posteroventral surface; mid tibia with 1 median anteroventral, 1 anterodorsal, 2 posterodorsal, and 2 posteroventral bristles; hind femur with 7 anteroventral bristles and 1 weak bristle on proximal half of posteroventral surface; hind tibia with 4 to 5 anteroventral, 4 to 5 anterodorsal, and 3 to 4 posterodorsal bristles. Wings with costal thorn strong, costal setulae semierect; veins R_{4+5} and M_{1+2} subparallel, *m-cu* cross vein slightly sinuate. Length, 6 mm.

Records:—1 ♂ Waterton, Alta., July 17, 1923 (H. L. Seamans); 1 ♂ Hedley, B.C., July 6, 1923; 1 ♂ Banff, Alta., Aug. 29, 1922; 2 ♂ 3 ♀ Sept. 7, 1922 (C. B. D. Garrett).

Type, allotype and *paratype,* No. 2921 in Canadian National Collection.

(to be continued)

A NEW PTENIDIUM FROM CALIFORNIA (COLEOP.).

BY F. J. PSOTA AND E. RAY,

Chicago. Ill.

Ptenidium californicus new species.

Subelliptical-elongate, upper surface of body clothed with short, silvery pubescence. Head and thorax black; elytra rufo-castaneous, with suture darker.

Head rounded in front, three strong foveae in a line near the base. Eyes coarsely granulate. Mouth parts and antennae flavous, the latter with a slender club composed of the last three joints. Thorax shining, twice as wide as long, sides strongly margined; hind margin with four strong foveae equidistant from each other; apical margin with two smaller foveae on each side, rather close to one another, and near the side margin. Scutellum black, large, triangular, with several small foveae or large punctures scattered over it. Elytra elongate, surface minutely, sparsely punctulate, with several large, scattered punctures extending over the basal fourth; tips round, covering pygidium. Under surface rufo-castaneous; legs paler, slender; ventral segments covered with long pubescence, and the pygidium of a lighter color than the others. Length, 1 mm.

The species is separated from its nearest ally, *P. foveatum* Matthews, a Guatemalan species, by its larger size, (.63-.75 mm. in *foveatum*), and by the different sculpture and color of the elytra (entirely smooth and black in *foveatum*).

Redwood Canyon, Contra Costa County, California, January, 1915. Collected by the late Mr. L. R. Reynolds. Described from sixteen specimens; type and fifteen paratypes in the collection of F. J. Psota.

The junior author, Eugene Ray, has taken the liberty of sending the dormant manuscript to the Canadian Entomologist, with the hope that it may eventually be published, as relations between the co-authors have been broken since the description was written.

BOOK NOTICE.

A Handbook of the Dragonflies of North America, by Jas. G. Needham and Hortense B. Heywood. 378 pages and numerous figures. C. C. Thomas, Springfield, Ill., 1929. Price $7.00.

The introduction to this work informs us that it is a "book for collectors of dragonflies and for students of their natural history." The object, as stated, is "conciseness and not completeness of description," and the two included things are "(1) enough description to serve for the recognition of the species and (2) the best knowledge that is available concerning the habits of the species."

The outstanding value of the work is that it combines in a single volume data which has heretofore been scattered throughout numerous monographs and periodicals. It is divided into two parts, Part I consisting of 46 pages, dealing with the general biology, etc. of dragonflies, while Part II treats of the taxonomy of the order with keys to the genera and species, and numerous illustrations of the accessory genitalia, wing-patterns, etc. Apparently the preparation of this second portion has been left too much in the hands of graduate students and the very necessary supervision on the part of the senior author has been partially, at least, lacking. Many of the keys must be handled with caution and some of the captions will prove stumbling-blocks to the inexperienced student; certain ones, notably that to *Ophiogomphus* species, are unworkable. The illustrations of the accessory genitalia are the merest outlines and could with advantage have been improved upon; they are, however, in the main fairly reliable although we note that those of *Gomphus furcifer* and *G. villosipes* and also *Somatochlora whitehousei* and *S. septentrionalis* have been interchanged; there are further several references in the text to non-existant figures.

The weakest portion of the work is that dealing with the distribution of the various species, although, to judge by the introduction, it is supposed to be one of the prominent features of the volume. From the standpoint of our Canadian species the records are woefully inadequate and it would appear as if our Canadian literature of the past fifteen or twenty years dealing with the Odonata fauna had been almost intentionally neglected. One of the most flagrant examples is found in the genus *Ophiogomphus* where only a single Canadian species is recorded, viz. *O. occidentis* Hagen from British Columbia; at least seven species of this genus have been reported as occurring in the Dominion and it is quite probable that several other eastern species will extend northward into southern Quebec and New Brunswick.

In spite of the above drawbacks the work will prove very essential to students and should be in every entomological library.

Mailed Monday, June 3rd, 1929.